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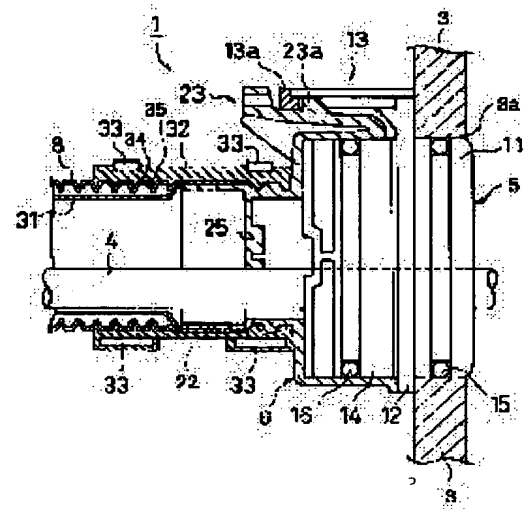
(22)Date of filing : 07.12.1995 (72)Inventor : TAKANO ETSUO

(54) SHIELD STRUCTURE OF CONNECTOR

(57)Abstract:

PROBLEM TO BE SOLVED: To electromagnetically shield a connecting wire without using a shield wire, and improve the reliability of the shielding.

SOLUTION: An equipment side connector 5 fixed to a case 3 containing an electronic equipment has an elastically deflecting and deforming lock part 13, and a connecting side connector 6 to be conductively connected to the equipment side connector 5 also has an elastically deflecting and deforming lock part. When the equipment side connector 5 is connected to the connecting side connector 6, the lock parts 13, 23 are elastically brought into contact with each other to ensure electromagnetic shielding.



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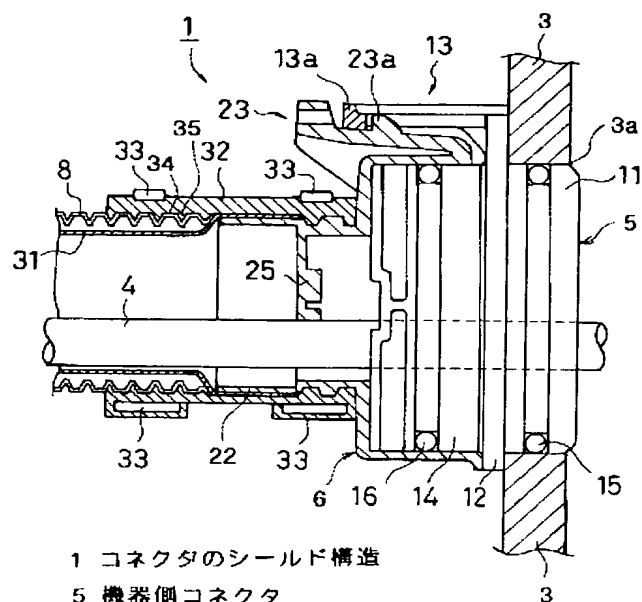
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(54) 【発明の名称】 コネクタのシールド構造

(57) 【要約】

【課題】 シールド線を用いることなく接続線を電磁シールドし、しかも電磁シールドの信頼性を向上させる。

【解決手段】 電子機器等を内装したケース3に固定される機器側コネクタ5に弾性的に撓み変形する係止部13を設ける一方、この機器側コネクタ5に導電性を有するように接続される接続側コネクタ6にも弾性的に撓み変形する係止部を設け、機器側コネクタ5と接続側コネクタ6とを接続させる際に、係止部13、23を弾的に接触させて電磁シールドを確実化するコネクタのシールド構造1。



1 コネクタのシールド構造

5 機器側コネクタ

6 接続側コネクタ

13, 23 係止部

13a, 23a 係止突起

【特許請求の範囲】

【請求項 1】 接続電線を挿通した状態で表面に施した導電性皮膜をケースに接触するように固定される機器側コネクタと、接続電線を挿通した状態で表面に施した導電性被膜が前記機器側コネクタに面接触するように接続される接続側コネクタとを備えたコネクタのシールド構造において、

前記機器側コネクタの一端に可撓性を有し、且つ表面に導電性被膜を施した係止突起を備えた係止部を設けるとともに、前記接続側コネクタの一端に可撓性を有し、且つ該接続側コネクタを前記機器側コネクタに接続する際に前記係止部を弾性的に撓ませ、前記係止突起を乗り越えさせた後に係止する係止突起を備えた係止部を設けたことを特徴とするコネクタのシールド構造。

【請求項 2】 前記係止部の一端に、押圧により該係止部を撓み変形させて前記係止突起の係止を解除する押圧部を設けたことを特徴とする請求項 1 記載のコネクタのシールド構造。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、シールド線を用いることなく、シールド線を用いた場合と同様のシールド効果を得るように構成したコネクタのシールド構造に関し、特に自動車に搭載した制御機器の如く確実なシールド性能が要求され、且つ低コスト化、メンテナンス性の向上が要求される場合に好適な配線技術に関する。

【0002】

【従来の技術】現在の自動車はCPUを含む各種電子機器が搭載され、当然のことながら高周波信号の授受には、ノイズによって機器の動作が不安定になることを回避するためにシールド線が使用される。そして、電子機器とシールド線を含む配線とは、組み立て時の作業性やメンテナンス時を考慮して一対のコネクタにより着脱自在に接続されるようになっている。

【0003】従来のシールド線配線の一例を図7～図9を参照して説明すると、図7に示すようなシールド線のシールド構造の場合、シールド編線84の芯線84aはその上を覆っている内部絶縁被覆層84bを所定の長さだけ剥いて露呈される。また、内部絶縁被覆層84bの上を覆っているシールド接続（ドレーン短絡）用の編線84cは内部絶縁被覆層84bよりも更に少し下がった位置で切断された外部被覆層84dの上に折り返される。そして、編線84cおよび外部被覆層84dの上に係止突起86aを有したゴム栓押さえ86、防水ゴム栓85、金属製の接続部材87を装着し、更にシールド編線84の先端の露呈した芯線84a上には端子固定金具81が固着される。

【0004】この端子固定金具81には、コネクタハウジング88が外嵌される。このコネクタハウジング88は、端子固定金具81に外嵌する円筒状のハウジング本

体89と、このハウジング本体89に外嵌したフランジ91と、ハウジング本体89とフランジ91との間に挟まれた円筒状の本体部90aおよびフランジ91の前面側に露呈する鍔部90bとを有した金属シェル90と、ハウジング本体89内に挿通された端子固定金具81に係合して該端子固定金具81のハウジング本体89からの抜けを防止するCリング93とで構成されている。

【0005】この端子固定金具81は、前端面に機器側の接続端子98をねじ止めするための雌ねじ部82aが形成されるとともに、前端側外周部にはCリング93に係合する係止溝82bが形成されている。また、基端面には芯線84aを挿入する芯線挿入孔83aが装備されており、芯線挿入孔83aに芯線84aを挿入した後、該芯線挿入孔83aの外周を加締めることによって芯線84aに固着される。また、接続部材87は、前述した金属シェル90を介して編線84cを電気機器の金属ケース94にシールド接続（ドレーン短絡）させるためのもので、金属シェル90の本体部90aに圧着される筒状部と、編線84cに圧着される筒状部とが一体形成された構造を呈している。

【0006】また、ゴムパッキン85は、端子固定金具81の上にコネクタハウジング88を外嵌させた際に、後方に延出しているフランジ91の筒状部とシールド編線84の外部被覆層84dとの間の隙間を塞いでコネクタハウジング88とシールド編線84との間を水密に保つものである。一方、コネクタハウジング88のハウジング本体89は、先端側が金属ケース94に形成された電線挿入孔95に挿通される筒状を呈しており、該ハウジング本体89の先端側の外周には、該ハウジング本体89と電線挿入孔95との間を防水するシールリング92が装着されている。また、該ハウジング本体89に外嵌したフランジ91は、ボルト100によって金属ケース94にねじ止めされた際、金属シェル90の鍔部90bが金属ケース94に確実に接触するように形成されている。

【0007】上述したシールド線のシールド構造では、図8に示すようにシールド編線84の芯線84aに加締め付けた端子固定金具81にコネクタハウジング88を組み付けた状態にする。次に、図9に示すようにコネクタハウジング88のハウジング本体89の先端を金属ケース94の電線挿入孔95に挿通させて、フランジ91をボルト100によって金属ケース94に固定する。また、ボルト101によって機器側の接続端子98を端子固定金具81の先端にねじ止めすれば、シールド編線84の芯線84aと機器側の接続端子98との電気的な接続と、シールド編線84の編線84cを金属ケース94に接続するシールド接続（ドレーン短絡）処理と、該シールド編線84と電線挿入孔95との間の防水処理とが確実に行われることになる。

【0008】

【発明が解決しようとする課題】しかしながら、上記従来構成のシールド線のシールド構造では、シールド線 84 の編線 84c を剥き出してから折り返す等の作業が必要であり、編線 84c と接続部材 87 との接触を良好にするためには、編線 84c の剥き出し範囲を大きくしなければならず、構造が複雑である上に組付け作業が面倒で作業性がよくなかった。

【0009】また、シールド線 84 自体も高価であり、端子固定金具 81 等の高精度な切削加工を必要とする部品が多いため、作業性がよくないことと相まってコストアップの一因になっていた。また、シールド線 84 の編線 84c は、接続部材 87 に圧着して接続するため、シールド線 84 の電線径が変わると接続部材 87 はもとよりゴムパッキン 85 等も交換しなければならず、設計自由度がなかった。

【0010】本発明の目的は、構造が簡単で組み立ておよび取り外しが容易である上に、電子機器間をシールド線を用いることなく電磁シールドした状態で接続するコネクタのシールド構造を提供することにある。

【0011】

【課題を解決するための手段】本発明に係る上記目的は、下記 (1) および (2) に示すように構成したコネクタのシールド構造により達成される。

(1) 接続電線を挿通した状態で表面に施した導電性被膜をケースに接触するように固定される機器側コネクタと、接続電線を挿通した状態で表面に施した導電性被膜が前記機器側コネクタに面接触するように接続される接続側コネクタとを備えたコネクタのシールド構造において、前記機器側コネクタの一端に可撓性を有し、且つ表面に導電性被膜を施した係止突起を備えた係止部を設けるとともに、前記接続側コネクタの一端に可撓性を有し、且つ該接続側コネクタを前記機器側コネクタに接続する際に前記係止部を弾性的に撓ませ、前記係止突起を乗り越えさせた後に係止する係止突起を備えた係止部を設けたことを特徴とするコネクタのシールド構造。

【0012】(2) 前記係止部の一端に、押圧により該係止部を撓み変形させて前記係止突起の係止を解除する押圧部を設けたことを特徴とする請求項 1 記載のコネクタのシールド構造。

【0013】本発明に係わる上記構成のコネクタのシールド構造によれば、機器側コネクタの表面には導電性被膜が施され、この機器側コネクタに接続される接続側コネクタの表面にも導電性被膜が施されている。前記機器側コネクタと前記接続側コネクタとは、表面が面接触するように接続されるので、両者は機械的に一体化されるとともに、電気的にも接続され内部を挿通した接続電線に対してシールド作用を有するようになる。

【0014】更に、本発明では、前記機器側コネクタに弾性を有する係止部が設けられ、この係止部の表面にも導電性被膜が形成されている。そして、接続側コネクタ

にも弾性を有する係止部が設けられ、その表面に導電性被膜が形成されているので、機器側コネクタに接続側コネクタを接続する際に係止部同士を係止させることにより、導電性接続がより一層確実に行われる。この結果、シールド線を使用することなく電線を電磁シールドすることができ、しかも前記係止部の弾性によって振動等による接触不良、言い換えればシールド不良を防止することができる。

【0015】また、接続側コネクタの係止部には押圧部が設けられているので、機器側コネクタから接続側コネクタを取り外す際は、押圧部を装置して係止部同士の係止を解除し、簡単に取り外すことができる。

【0016】

【発明の実施の形態】以下、本発明を適用したコネクタのシールド構造の実施形態を図 1～図 6 に基づいて詳細に説明する。図 1 は本発明のコネクタのシールド構造を示す一部切欠側面図、図 2 はコネクタのシールド構造の構成を示す他の側面図、図 3 はコネクタを係止する際の係止部の作用を示す一部切欠側面図、図 4 はコネクタ係止後の作用を示す一部切欠側面図、図 5 はコネクタの係止部の構成と係止作用を示す要部の拡大断面図、図 6 はコネクタの使用形態を示す模式的説明図である。

【0017】先ず、本実施形態におけるコネクタのシールド構造（以下、単にシールド構造と略称する）1 の使用形態を説明する。このシールド構造 1 は、図 6 に示すようにケース 2、3 内に内装した電子機器（図示省略）を例えば高圧ケーブル 4 で、且つシールド状態で接続する際に使用されるものであり、図 6 の右方に示すようにケース 3 に固定される機器側コネクタ 5 と、この機器側コネクタ 5 に着脱自在に接続される接続側コネクタ 6 を備えている。

【0018】また、ケース 2 に固定されるコネクタ 7 と接続側コネクタ 6 とは、後述するシールドシートを巻き付けたコルゲートチューブ 8 を介して接続されている。そして、コネクタ 7、コルゲートチューブ 8、接続側コネクタ 6、機器側コネクタ 5 の内部には、接続電線に相当する高圧ケーブル 4 が挿通している。したがって、高圧ケーブル 4 は電磁シールドされた状態で電子機器を接続することになり、高圧ケーブル 4 から発生するノイズ等の影響を防止することができ、高価かつ配線作業の面倒なシールド構造が不要になる。

【0019】次に、シールド構造 1 を構成する各部材について説明する。機器側コネクタ 5 は、図 1 以下の各図に示すようにケース 3 に形成した取付口 3a に嵌合する筒状の嵌合部 11 と、ケース 3 にネジ止め固定するフランジ 12 と、接続側コネクタ 6 に係止する係止部 13 と、接続側コネクタ 6 を被せるように構成された筒状の接続部 14 とを備えている。そして、嵌合部 11 の外側面にはゴム等の O リング 15 が嵌合され、取付口 3a に圧接してケース 3 内への水分の浸潤を防止するようにな

っている。また、接続部14の外側面にもOリング16が嵌合され、接続側コネクタ6との間を水密に保持するようになっている。

【0020】なお、機器側コネクタ5は合成樹脂を一体成形したものであるが、外側面全体に導電性被膜に相当する例えばNiメッキ等が施され、フランジ12を介してケース3に固定することにより全体がケース3に電気的に接続されるようになっている。なお、フランジ12にはネジ挿通孔12aが形成され、ケース3にネジ留めするようになっている。

【0021】ところで、係止部13はフランジ12の近傍から接続部14方向に長手状に張り出した形状であって、全体が上下方向に弾性を有している。この係止部13の先端には、下方に向けて係止突起13aが設けられ、後に説明するように接続側コネクタ6を弾性的に係止するようになっている。なお、係止部13の両側には、図2に示すように所定間隔を介してガイド部材18a、18bが設けられ、接続側コネクタ6に設けた係止部材をガイドするように構成されている。

【0022】接続側コネクタ6は、図1および図3等に断面構造で示すように基本的には筒体であるが、機器側コネクタ5の接続部14に外側から被嵌するように寸法設定された嵌合部21と、コルゲート8を被せて係合する係合部22と、前記係止部13に係止させるための係止部23等を備え、係合部22の外側面には後述するコルゲート押さえ32に係止するための係止溝24が形成されている。また、係合部22内には仕切り壁25が形成され、この仕切り壁25には3個の電線挿通孔26が形成されていて、高圧ケーブル4を所定間隔で挿通させるようになっている。

【0023】係止部23は、嵌合部21から係合部22方向に向けて長手状に形成され、全体が上下方向に弾性的に変形するようになっている。係止部23は板状であり、そのほぼ中央部に上側に向けて係止突起23aが形成され、先端部には突状の押動部23bが形成されている。この係止部23の表面全体、すなわち係止突起23aの表面等にも、Niメッキ等の導電性メッキが施されている。したがって、機器側コネクタ5に接続側コネクタ6を被せ、且つ係止部13、23に係止させると機械的に一体化されるとともに、接続部14と嵌合部21とが密に接触する上に、係止部13、23が弾性的に接触するので電気的に低抵抗で、しかも接触不良等の無い状態で接触することになる。

【0024】コルゲートチューブ8は、図1に示すように可撓性を有する合成樹脂を蛇腹状に形成したものであり、その内部にはシールドシート31が巻き付けられている。そして、コルゲートチューブ8の端部は、接続側コネクタ6の係合部22の外側に被せられ、その外側からコルゲート押さえ32によって係合部22に圧接するように締め付けられる。なお、コルゲート押さえ32の

元の形状は、筒状体を長手方向に半割りした形状であり、半割り部材に係止具33により係止して筒状に構成するようになっている。すなわち、図1に示すように係合部22にコルゲートチューブ8の一端を被せ、次いで外側から半割り部材を被せた後、係止具33を用いて筒状に構成することにより、コルゲートチューブ8が係合部22に締め付け固定される。

【0025】係合部22の外側面は前記のようにNiメッキされ、コルゲートチューブ8の内側面にはシールドシート31が巻き付けられている。したがって、シールドシート31と係合部22、言い換えれば接続側コネクタ6とは電気的に接続され、コルゲートチューブ8内および接続側コネクタ6内を挿通する高圧ケーブル4が電磁シールドされることになる。なお、コルゲート押さえ32の内側面の一部には、コルゲートチューブ8の蛇腹形状に係合する係合溝34と、前記係止溝24に係止する係止突起35が環状に形成されている。故に、図1に示すように嵌合部21にコルゲートチューブ8を被せた状態では、コルゲートチューブ8は抜け出し不可になり、電気的には接触不良等が無いように接続側コネクタ6に接続されることになる。

【0026】次に、機器側コネクタ5と接続側コネクタ6との係止作用を説明する。この場合、高圧ケーブル4を挿通させたコルゲートチューブ8を接続側コネクタ6に取り付ける。この取付は、前記のようにコルゲート押さえ32によって行う。次に、ケース2にフランジ12を介して固定されている機器側コネクタ5に高圧ケーブル4を挿通させ、更に接続側コネクタ6を押し込むと、図3および図5に示すように係止突起13a、23aが接触するようになる。

【0027】係止突起13a、23bの接触面は、図5に拡大して示したようにテーパ面に形成されているので、接続側コネクタ6を更に押し込むと係止部23全体が矢印Aで示す方向に撓み変形する。この結果、係止突起13aが係止突起23aを乗り越えるようになり、更に押し込むことによって図4等に示すように係止突起13aが係止突起23aを完全に乗り越えて、係止突起23aと押動部23bとの間に嵌まり込むようになる。

【0028】この時点では、接続側コネクタ6が接続部14全体に被さり、嵌合部21の内側面がOリング16に圧接し、機器側コネクタ5と接続側コネクタ6とが水密状態で完全に一体化される。しかも、係止部13、23全体が弾性を有していて、この係止部13、23の表面はもとより係止突起12a、23aの表面にも導電性メッキが施されているので、電気的にも低抵抗で接触することになる。この結果、高圧ケーブル4は、コルゲートチューブ8、接続側コネクタ6、機器側コネクタ5により電磁的に完全にシールドされ、電子機器が安定に動作できるようになる。

【0029】なお、図6に示すケース2についても電磁

シールド機能を有するコネクタ 7 が固定され、高圧ケーブル 4 はコネクタ 7 を介してケース 2 内の電子機器に接続される。したがって、高圧ケーブル 4 の配線位置のいずれにおいても電磁シールドされることがになり、不所望なノイズの重畳等を完全に防止することができる。また高圧ケーブル 4 の端末には接続端子 9 が圧着等により接続され、電子機器のターミナルに簡便に接続できるようになっている。

【0030】以上説明したように、本発明を適用したコネクタのシールド構造にあつては、高圧ケーブルを挿通したコルゲートチューブを接続側コネクタに接続し、この接続側コネクタを機器側コネクタに接続することによって、シールド線を用いることなくケース内の電子機器を電磁シールドした状態で接続することができる。しかも、機器側コネクタと接続側コネクタとは、双方に設けた弾性を有する係止部により導電性を有するように接続されているので、仮に振動が加わっても導電性、すなわちシールド性が損なわれることがなく、自動車等の使用環境の厳しい機器や装置に適用した場合、信頼性を大幅に向上させることができる。

【0031】

【発明の効果】以上説明したように本発明に係るコネクタのシールド構造は、電子機器等を内装したケース等に固定される機器側コネクタの表面に導電性被膜を施し、この機器側コネクタに接続される接続側コネクタの表面にも導電性被膜を施し、前記機器側コネクタと前記接続側コネクタとを接続する際にコネクタ同士が面接触で導電性を有するように接続させるとともに、前記機器側コネクタに設けた弾性を有し且つ表面に導電性被膜を施した係止部と、接続側コネクタに設けた弾性を有し且つ表面に導電性被膜を施した係止部とを弾性的に接触させるものである。

【0032】よって、機器側コネクタおよび接続側コネクタ内に挿通した高圧ケーブル等の接続電線は、機器側コネクタと接続側コネクタとにより電磁シールドされる。更に、係止部同士が弾性的に接触しているので導電性接触がより確実に行われ、振動等が加えられても接触

不良になる危険性が無く、電磁シールドが損なわれな。このため、自動車等の使用環境の厳しい機器や装置に適用した場合、信頼性が向上を大幅に向上させることができる。また、シールド線が不要なこと、製造が容易なことと相まって、製造コストの低減を図ることができ、更にメンテナンスも容易になる等の高価を奏するものである。

【図面の簡単な説明】

【図 1】本発明の実施形態であるコネクタのシールド構造を示す一部切欠側面図である。

【図 2】コネクタのシールド構造の構成を示す他の側面図である。

【図 3】コネクタ接続時の係止部の作用を示す一部切欠側面図である。

【図 4】係止部を係止した状態を示す一部切欠側面図である。

【図 5】係止部の作用を示す要部の拡大断面図である。

【図 6】コネクタのシールド構造の使用形態を示す模式的説明図である。

【図 7】従来のシールド構造の一例を示す断面図である。

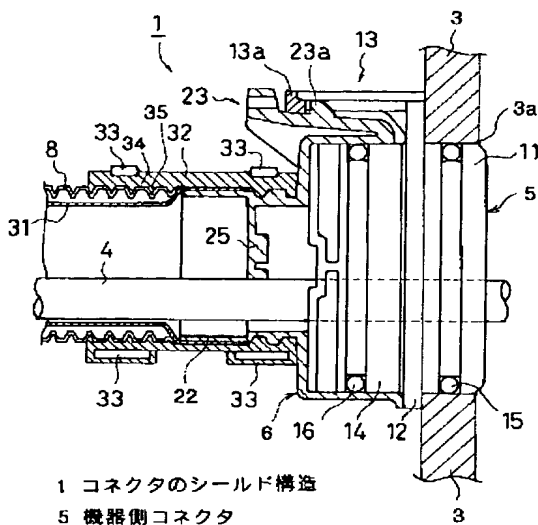
【図 8】図 7 におけるシールド構造の組み立てた状態を示す断面図である。

【図 9】図 7 におけるシールド構造の組付け完了状態を示す断面図である。

【符号の説明】

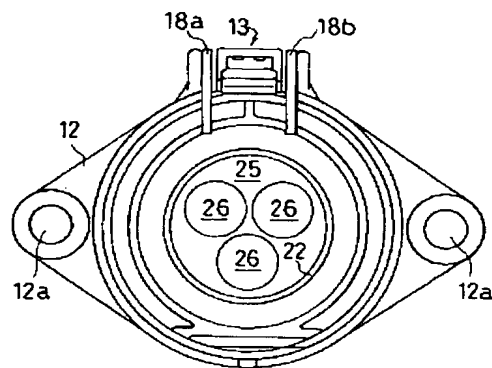
- 1 コネクタのシールド構造
- 2、3 ケース
- 4 高圧ケーブル
- 5 機器側コネクタ
- 6 接続側コネクタ
- 8 コルゲートチューブ
- 11 嵌合部
- 13、23 係止部
- 13a、23a 係止突起
- 14 接続部
- 15、16 Oリング

【図 1】

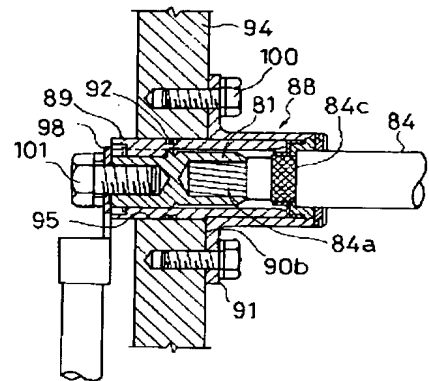


- 1 コネクタのシールド構造
 5 機器側コネクタ
 6 接続側コネクタ
 13, 23 係止部
 13a, 23a 係止突起

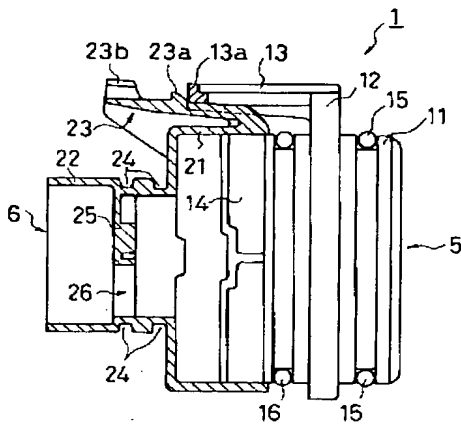
【図 2】



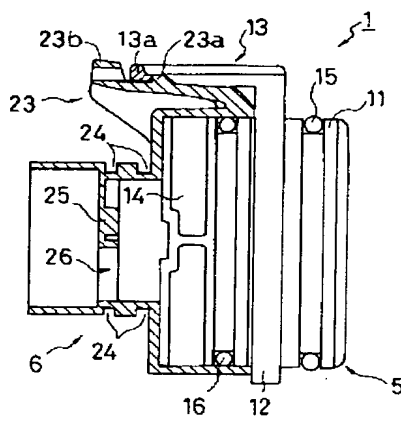
【図 9】



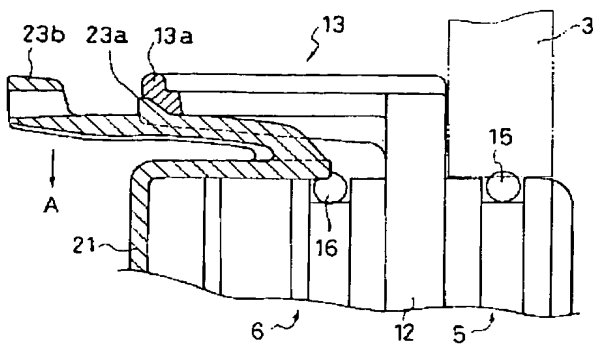
【図 3】



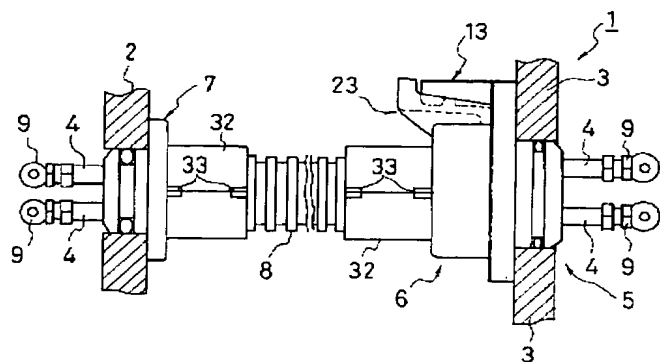
【図 4】



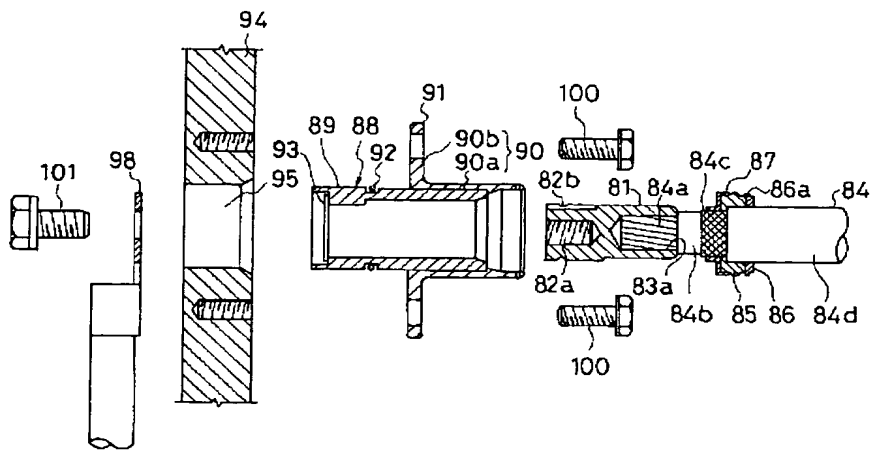
【図 5】



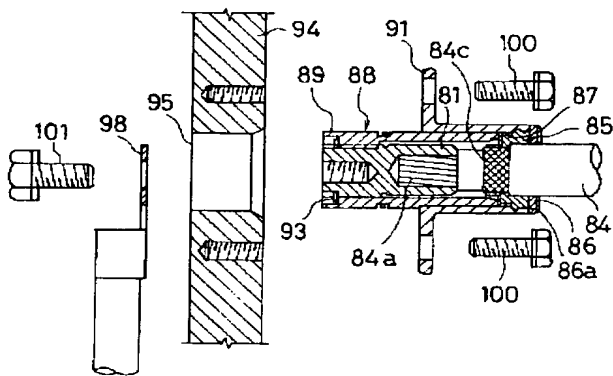
【図 6】



【図 7】



【図 8】



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CLAIMS

[Claim(s)]

[Claim 1] The connector terminal connected to the terminal section of a shield electric wire The electric wire attachment case fixed to the attachment mouth which carried out protection hold of the terminal section of the aforementioned shield electric wire, and carried out opening to the case of an electrical machinery and apparatus The corrugated electrode holder with which a this electric wire attachment case electric wire insertion-side is equipped The corrugate tube for shield electric wire protection connected to an aforementioned electric wire attachment case electric wire insertion-side through this corrugated electrode holder While being the shield connector equipped with the above, and the aforementioned corrugated electrode holder's consisting of half covering of a couple which carries out phase opposite and equipping each of this half covering with outer covering and inner covering While the case plug room to an aforementioned electric wire attachment case electric wire insertion-side is formed between this outer covering and inner covering and the aforementioned inner covering equips the end section of inner skin with the electric wire stop section corresponding to the aforementioned shield electric wire The other end is equipped with the tube attachment slot of two or more articles which engages with the aforementioned corrugate tube, and the aforementioned outer covering is characterized by having a covering fixed part corresponding to the peripheral wall of the aforementioned electric wire attachment case.

[Claim 2] The shield connector according to claim 1 characterized by inserting the sheath retaining ring which compresses the direction of a path into the sheath of the aforementioned shield electric wire.

[Claim 3] It is the shield connector according to claim 2 which the aforementioned sheath retaining ring has a level difference, is formed from ***** of a minor diameter, and the stopper section of a major diameter, and is characterized by this stopper section having the path of the size which the edge which carries out opening can attach to the electric wire stop section of the aforementioned corrugated electrode holder.

[Claim 4] The claim 1 characterized by inserting the rubber stopper in which the aforementioned electric wire stop section and engagement are possible in the aforementioned shield electric wire, or a shield connector according to claim 3.

[Claim 5] The claim 1 characterized by engaging the aforementioned electric wire stop section between the aforementioned sheath retaining rings and rubber stoppers which were inserted in the aforementioned shield electric wire, or a shield connector according to claim 4.

[Claim 6] The aforementioned electric wire stop section is the claim 1 characterized by being the salient which project at equal intervals towards the shaft of the aforementioned corrugated electrode holder, or a shield connector according to claim 5.

[Claim 7] The aforementioned electric wire stop section is the claim 1 characterized by being a protruding line holding the aforementioned shield electric wire, or a shield connector according to claim 5.

[Claim 8] The claim 1 characterized by extending the inner bark of the aforementioned shield electric wire from opening by the side of the connector terminal strapping of the aforementioned electric wire

attachment case, and inserting the inner-bark retaining ring with a collar in which the aforementioned opening and attachment are possible in this inner bark, or a shield connector according to claim 7.

[Claim 9] the shell through which the aforementioned inner-bark retaining ring flows electrically in the braid of the aforementioned shield electric wire -- the shield connector according to claim 8 characterized by the stopper to movement and bird clapper by the side of the aforementioned connector terminal of a member

[Claim 10] The aforementioned inner-bark retaining ring is a shield connector according to claim 8 or 9 characterized by being formed by the insulator.

[Claim 11] The connector terminal connected to the terminal section of a shield electric wire The inner case which holds this connector terminal and carries out stop fixation The outer case which covers the aforementioned shield electric wire terminal section, and is connected to the connector of the other party while surrounding this inner case The corrugated electrode holder with which a this outer case electric wire insertion-side is equipped The corrugate tube for shield electric wire protection connected to an aforementioned outer case electric wire insertion-side through this corrugated electrode holder While being the shield connector equipped with the above, and the aforementioned corrugated electrode holder's consisting of half covering of a couple which carries out phase opposite and equipping each of this half covering with outer covering and inner covering While the case plug room to an aforementioned outer case electric wire insertion-side is formed between this outer covering and inner covering and the aforementioned inner covering equips the end section of inner skin with the electric wire stop section corresponding to the aforementioned shield electric wire The other end is equipped with the tube attachment slot of two or more articles which engages with the aforementioned corrugate tube, and the aforementioned outer covering is characterized by having a covering fixed part corresponding to the peripheral wall of the aforementioned outer case.

[Claim 12] The shield connector according to claim 11 characterized by inserting the sheath retaining ring which compresses the direction of a path into the sheath of the aforementioned shield electric wire.

[Claim 13] It is the shield connector according to claim 12 which the aforementioned sheath retaining ring has a level difference, is formed from ***** of a minor diameter, and the stopper section of a major diameter, and is characterized by this stopper section having the path of the size which the edge which carries out opening can attach to the electric wire stop section of the aforementioned corrugated electrode holder.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the shield connector using the shield electric wire used for electric system wiring of an automobile etc.

[0002]

[Description of the Prior Art] Drawing 11 showed the shield connector 1 indicated by JP,1-112580,U, and this shield connector 1 is equipped with two or more connector terminals 3 connected to core-wire 2a of the shield electric wire 2, and the metal connector housing 4 which holds each of this connector terminal 3.

[0003] The connector housing 4 has terminal hold room 4a opened wide ahead, and is carrying out wearing hold of each aforementioned connector terminal 3. Behind terminal hold room 4a, fixed room 4b to the shield electric wire 2 is formed.

[0004] It scalps the terminal section, and near [the] the scalped part part, on sheath 2b, the tube 5 made from rubber or plastics was put, and, in the shield electric wire 2, the tube 5 has resulted to the outside of the connector housing 4. Thread-fastening fixation of the shield electric wire 2 is carried out by the upper shell clamp 6 of a tube 5 at fixed room 4b. In addition, 2in drawing c shows the shield layer (braid) which constitutes the shield electric wire 2.

[0005] If it was in the above-mentioned conventional technology, the bolting force of the clamp 6 to the shield electric wire 2 will be absorbed with a tube 5, and the shield electric wire 2 was not able to be called that to which sufficient fixation is carried out. That is, in case the shield connector 1 is sampled from the connector (not shown) of the other party, when the shield electric wire 2 is pulled without pressing down the connector housing 4 by hand, there is a trouble that gap will arise in sheath 2b, shield layer 2c, etc.

[0006] On the other hand, the connector in vehicles, such as a shield connector, needs to give waterproof construction according to the use gestalt. This is to flood the high-pressure wash water by car washing etc. in connector housing, and to prevent generating of the situation which is not desirable on electrical connection, and, generally the waterproof construction by which the connector as shown below was equipped with rear electrode-holder covering is known.

[0007] Drawing 12 shows the rear electrode-holder covering 11 indicated by JP,7-122330,A. The rear electrode holder 13 and the half coverings 14a and 14b of the tabular fitted in the connector housing 12 are formed in one through hinges 15 and 15, and the rear electrode-holder covering 11 changes.

[0008] The half coverings 14a and 14b are symmetrical configurations, half covering 14b is equipped with covering stop height 16a for stopping half covering 14a, and covering stop salient receiving part 16b, and half covering 14a is similarly equipped with covering stop height 16c for stopping half covering 14b, and 16d of covering stop salient receiving parts. Moreover, the fixed hole 17 corresponding to two or more fixed salient 12a prepared in the connector housing 12 is formed in the half coverings 14a and 14b, and the fixed slot 19 (drawing 13) which carries out attachment fixation of the corrugate tube 18 (drawing 13) further is formed.

[0009] The attachment sequence of the rear electrode-holder covering 11 attaches the rear electrode holder 13 in the connector housing 12 first, as shown in drawing 13 . Next, the half coverings 14a and 14b are rotated in the direction of ***** arrow P through a hinge 15, and attachment fixation of the corrugate tube 18 which contained the electric wire which does not illustrate the covering stop heights 16a and 16c and the covering stop salient receiving parts 16b and 16d into the fixed slot 19 while being engaged, respectively is carried out. Then, the fixed hole 17 is fitted into fixed salient 12a almost simultaneous. Thereby, an engagement stop is carried out and the rear electrode-holder covering 11 is united with the connector housing 12.

[0010] if it is in the above-mentioned conventional technology, since the rear electrode holder 13 and the half coverings 14a and 14b are fabricated by one through hinges 15 and 15 -- fabrication -- metal mold -- structure will become very complicated Moreover, if per metal mold of the rear electrode-holder covering 11 takes, a number decreases and the productivity is thought as important, since large-sized forming equipment will be used, there is a trouble that a manufacturing cost is applied.

[0011]

[Problem(s) to be Solved by the Invention] this invention makes it a technical problem to offer the shield connector which can aim at reduction of a manufacturing cost, and gap prevention of the sheath of a shield electric wire etc., respectively in order to solve the above-mentioned trouble.

[0012]

[Means for Solving the Problem] The shield connector accomplished by this invention in order to solve the above-mentioned technical problem The connector terminal connected to the terminal section of a shield electric wire as indicated by the claim 1, The electric wire attachment case fixed to the attachment mouth which carried out protection hold of the terminal section of the aforementioned shield electric wire, and carried out opening to the case of an electrical machinery and apparatus, It is a shield connector equipped with the corrugated electrode holder with which a this electric wire attachment case electric wire insertion-side is equipped, and the corrugate tube for shield electric wire protection connected to an aforementioned electric wire attachment case electric wire insertion-side through this corrugated electrode holder. While the aforementioned corrugated electrode holder consists of half covering of a couple which carries out phase opposite and each of this half covering is equipped with outer covering and inner covering While the case plug room to an aforementioned electric wire attachment case electric wire insertion-side is formed between this outer covering and inner covering and the aforementioned inner covering equips the end section of inner skin with the electric wire stop section corresponding to the aforementioned shield electric wire The other end is equipped with the tube attachment slot of two or more articles which engages with the aforementioned corrugate tube, and the aforementioned outer covering is characterized by having a covering fixed part corresponding to the peripheral wall of the aforementioned electric wire attachment case.

[0013] In the above-mentioned composition, a shield connector has the connector terminal connected to the terminal section of a shield electric wire, the electric wire attachment case which are fixed to the attachment mouth which carried out protection hold of the terminal section of a shield electric wire, and carried out opening to the case of an electrical machinery and apparatus, the corrugated electrode holder with which the electric wire insertion side of the electric wire attachment case is equipped, and the corrugate tube for shield electric wire protection which are connected to an electric wire attachment case electric wire insertion-side through a corrugated electrode holder. Moreover, a corrugated electrode holder consists of half covering of a couple which carries out phase opposite, and each half covering forms the case plug room to an electric wire attachment case electric wire insertion-side between outer covering and inner covering while being equipped with outer covering and inner covering. Inner covering equips the other end with the tube attachment slot of two or more articles which engages with a corrugate tube while equipping the end section of inner skin with the electric wire stop section corresponding to a shield electric wire. Moreover, outer covering has a covering fixed part corresponding to the peripheral wall of an electric wire attachment case. fabrication since it has in one the composition attached in an electric wire attachment case and is a symmetrical configuration, while each half covering carries out the engagement stop of a shield electric wire and the corrugate tube

according to this -- the die split structure of metal mold can be simplified, and since per metal mold can take even if it does not use still more large-sized forming equipment, and a number can also be increased, a manufacturing cost can be reduced

[0014] this invention of a claim 2 is characterized by inserting the sheath retaining ring which compresses the direction of a path into the sheath of the aforementioned shield electric wire.

[0015] By inserting the sheath retaining ring which compresses the direction of a path into the sheath of a shield electric wire, even if sudden external force joins a shield electric wire, gap of a sheath etc. can be prevented.

[0016] The aforementioned sheath retaining ring has a level difference from ***** of a minor diameter, and the stopper section of a major diameter, this invention of a claim 3 is formed, and it is characterized by this stopper section having the path of the size which the edge which carries out opening can attach to the electric wire stop section of the aforementioned corrugated electrode holder.

[0017] From ***** of a minor diameter, and the stopper section of a major diameter, a sheath retaining ring has a level difference and is formed. The stopper section has the path of the size which the edge which carries out opening can attach to the electric wire stop section of a corrugated electrode holder. Even if sudden external force joins a shield electric wire by this and a shield electric wire moves, the stopper section is stopped by the electric wire stop section, and can prevent gap of a sheath etc.

[0018] this invention of a claim 4 is characterized by inserting the rubber stopper in which the aforementioned electric wire stop section and engagement are possible in the aforementioned shield electric wire.

[0019] Since the electric wire stop section can hold down a rubber stopper and can insert it in an electric wire attachment case certainly in the assembly of a shield connector by inserting the rubber stopper in which the electric wire stop section and engagement are possible in a shield electric wire, there is no troublesomeness which puts in a rubber stopper by hand one by one, and workability can be improved.

[0020] this invention of a claim 5 is characterized by engaging the aforementioned electric wire stop section between the aforementioned sheath retaining rings and rubber stoppers which were inserted in the aforementioned shield electric wire.

[0021] The electric wire stop section is engaged between the sheath retaining rings and rubber stoppers which were inserted in the shield electric wire. Thereby, the electric wire stop section can accomplish easily gap prevention of a sheath etc. and the improvement of workability to a rubber stopper.

[0022] this invention of a claim 6 is characterized by the aforementioned electric wire stop section being a salient which project at equal intervals towards the shaft of the aforementioned corrugated electrode holder.

[0023] since the electric wire stop sections are two or more salients which project at equal intervals towards the shaft of a corrugated electrode holder -- fabrication -- the die split structure of metal mold can be simplified, and engagement of half covering, simultaneously the nose of cam of a salient can stop a shield electric wire

[0024] It is characterized by this invention of a claim 7 being a protruding line to which the aforementioned electric wire stop section holds the aforementioned shield electric wire.

[0025] since the electric wire stop section is a protruding line holding a shield electric wire -- fabrication -- the die split structure of metal mold can be simplified, and a shield electric wire can be stopped on the curved surface at engagement of half covering, simultaneously the nose of cam of a protruding line

[0026] this invention of a claim 8 extends the inner bark of the aforementioned shield electric wire from opening by the side of the connector terminal strapping of the aforementioned electric wire attachment case, and is characterized by inserting the inner-bark retaining ring with a collar in which the aforementioned opening and attachment are possible in this inner bark.

[0027] The inner bark of a shield electric wire is extended from opening by the side of the connector terminal strapping of an electric wire attachment case. The inner-bark retaining ring with a collar in which the aforementioned opening and attachment are possible is inserted in an inner bark. Even if sudden external force tends to join a shield electric wire by this and a shield electric wire tends to move, an engagement stop is carried out at an electric wire attachment case, and an inner-bark retaining ring

can prevent gap of a sheath etc.

[0028] the shell to which the aforementioned inner-bark retaining ring flows through this invention of a claim 9 electrically in the braid of the aforementioned shield electric wire -- it is characterized by the stopper and bird clapper to movement by the side of the aforementioned connector terminal of a member

[0029] the shell through which an inner-bark retaining ring flows electrically in the braid of a shield electric wire -- it becomes a stopper to movement by the side of the aforementioned connector terminal of a member thereby -- shell -- gap of a member can be prevented and generating of an electric poor contact can also be avoided Moreover, an inner-bark retaining ring becomes a stopper to movement by the side of the terminal of an electric wire attachment case similarly.

[0030] this invention of a claim 10 is characterized by fabricating the aforementioned inner-bark retaining ring by the insulator.

[0031] Since the inner-bark retaining ring is fabricated by the insulator, short-circuit with a connector terminal and the above-mentioned shell member can be prevented.

[0032] The connector terminal by which this invention of a claim 11 is connected to the terminal section of a shield electric wire, The inner case which holds this connector terminal and carries out stop fixation, and the outer case which covers the aforementioned shield electric wire terminal section, and is connected to the connector of the other party while surrounding this inner case, It is a shield connector equipped with the corrugated electrode holder with which a this outer case electric wire insertion-side is equipped, and the corrugate tube for shield electric wire protection connected to an aforementioned outer case electric wire insertion-side through this corrugated electrode holder. While the aforementioned corrugated electrode holder consists of half covering of a couple which carries out phase opposite and each of this half covering is equipped with outer covering and inner covering While the case plug room to an aforementioned outer case electric wire insertion-side is formed between this outer covering and inner covering and the aforementioned inner covering equips the end section of inner skin with the electric wire stop section corresponding to the aforementioned shield electric wire The other end is equipped with the tube attachment slot of two or more articles which engages with the aforementioned corrugate tube, and the aforementioned outer covering is characterized by having a covering fixed part corresponding to the peripheral wall of the aforementioned outer case.

[0033] A shield connector is equipped with the connector terminal connected to the terminal section of a shield electric wire, the inner case which holds a connector terminal and carries out stop fixation, the outer case which covers the terminal section of a shield electric wire and is connected to the connector of the other party while surrounding this inner case, the corrugated electrode holder with which an outer case electric wire insertion-side is equipped, and the corrugate tube for shield electric wire protection which are connected to an outer case electric wire insertion-side through this corrugated electrode holder. Moreover, a corrugated electrode holder consists of half covering of a couple which carries out phase opposite, and each half covering forms the case plug room to an aforementioned outer case electric wire insertion-side between outer covering and inner covering while being equipped with outer covering and inner covering. Inner covering equips the other end with the tube attachment slot of two or more articles which engages with a corrugate tube while equipping the end section of inner skin with the electric wire stop section corresponding to a shield electric wire. Moreover, outer covering has a covering fixed part corresponding to the peripheral wall of the aforementioned outer case. fabrication since it has in one the composition attached in an outer case and is a symmetrical configuration, while each half covering carries out the engagement stop of a shield electric wire and the corrugate tube according to this -- the die split structure of metal mold can be simplified, and since per metal mold can take even if it does not use still more large-sized forming equipment, and a number can also be increased, a manufacturing cost can be reduced

[0034] this invention of a claim 12 is characterized by inserting the sheath retaining ring which compresses the direction of a path into the sheath of the aforementioned shield electric wire.

[0035] By inserting the sheath retaining ring which compresses the direction of a path into the sheath of a shield electric wire, even if sudden external force joins a shield electric wire, gap of a sheath etc. can

be prevented.

[0036] The aforementioned sheath retaining ring has a level difference from ***** of a minor diameter, and the stopper section of a major diameter, this invention of a claim 13 is formed, and it is characterized by this stopper section having the path of the size which the edge which carries out opening can attach to the electric wire stop section of the aforementioned corrugated electrode holder.

[0037] From ***** of a minor diameter, and the stopper section of a major diameter, a sheath retaining ring has a level difference and is formed. The stopper section has the path of the size which the edge which carries out opening can attach to the electric wire stop section of a corrugated electrode holder. Even if sudden external force joins a shield electric wire by this and a shield electric wire moves, the stopper section is stopped by the electric wire stop section, and can prevent gap of a sheath etc.

[0038]

[Embodiments of the Invention] Hereafter, the form of 1 operation of this invention is explained based on a drawing. Drawing 1 shows the decomposition perspective diagram of the shield connector of this invention, and the front view of the shield connector accomplished when drawing 2 assembled the composition member of drawing 1, an a-a cross section [as opposed to drawing 2 in drawing 3], and drawing 4 show the expansion perspective diagram of the corrugated electrode holder shown in drawing 1.

[0039] In drawing 1 or drawing 3, 21 shows the shield connector used for electric system wiring of an electric vehicle, and this shield connector 21 consists of the electric wire attachment case A, the same corrugated electrode holders B made of synthetic resin, the shield electric wires C, the connector terminals D, corrugate tubes E, etc. made of synthetic resin.

[0040] The ends are the cylinder objects which carried out opening, the electric wire attachment case A has the attachment section 22 to the motor case which is not illustrated in the peripheral-wall middle, and the attachment cylinder part 23 of the minor diameter inserted in the attachment mouth which carried out opening of the front portion of the attachment section 22 to the motor case which does not carry out [aforementioned] illustration, and the back portion are formed as a case main part 24 of the major diameter to the aforementioned shield electric wire C.

[0041] A concave 25 (drawing 1, three references) is attached in the middle of peripheral-wall 23a of the attachment cylinder part 23, and the seal ring 26 made of rubber is inserted in the concave 25. moreover -- the nose of cam 27 (drawing 1, three references) of the attachment cylinder part 23, i.e., front end opening of the electric wire attachment case A, -- a conductive sheet metal -- a press and the 1st shell formed by carrying out folding -- it is equipped with the member 28 (drawing 2, three references) In addition, the electric wire attachment case A carries out thread-fastening fixation of the attachment section 22, and the motor case which does not carry out [aforementioned] illustration is equipped with it.

[0042] The case main part 24 protrudes the fixed salients 29 and 29 of a couple which carry out phase opposite in the middle of the peripheral-wall 24a, and in order to make easy fitting of the aforementioned corrugated electrode holder B, taper side 29a gone down towards the edge 30 by the side of electric wire insertion of the case main part 24, i.e., back end opening of the electric wire attachment case A, is formed in each fixed salient 29.

[0043] On the other hand, sequentially from the back end opening 30, the electrode-holder engagement room 31 of a major diameter and the rubber stopper engagement room 32 of a minor diameter have a level difference 33, and are formed, internal 24b of the case main part 24 is further prolonged in the shaft of the electric wire attachment case A, and parallel ahead of the rubber stopper engagement room 32, as shown in drawing 3, and the two or more articles protruding line 35 which has the level difference 34 as a stop step protrudes at equal intervals.

[0044] As the corrugated electrode holder B is shown in drawing 4, it consists of the half coverings 36 and 36 of a couple which carry out phase opposite, and each half covering 36 is equipped with the outer covering 37 to peripheral-wall 24a of the aforementioned case main part 24, and the inner covering 38 held in the electrode-holder engagement room 31 of the case main part 24. The back end is connected and the outer covering 37 and the inner covering 38 are formed for the outer covering 37 in the form of

this 1 operation suitably for a long time than the inner covering 38 with which it has the length corresponding to the depth of the electrode-holder engagement room 31. Moreover, the case plug room 39 to the back end opening 30 side of the aforementioned case main part 24 is formed between the outer covering 37 and the inner covering 38 (i.e., between inner skin 37a of the outer covering 37, and peripheral face 38a of the inner covering 38).

[0045] While forming two or more electric wire stop salients 40 as the electric wire stop section in a front portion at equal intervals at inner skin 38b of the inner covering 38, the tube attachment slot 41 is attached around a back portion two or more articles. In each electric wire stop salient 40, the pin-like salient 42 protrudes on one side, and salient **** 43 corresponding to the pin-like salient 42 is formed in another side at the electric wire stop salients 40a and 40b located in the ends of the inner covering 38.

[0046] On the other hand, in inner skin 37a, the outer covering 37 has the interior 44 of a taper-like proposal corresponding to the aforementioned fixed salient 29 for the point [a part of], and is drilling the fixed hole 45 of the rectangle as a covering fixed part in the middle.

[0047] The shield electric wire C is a core wire C1, an inner bark C2, a braid C3, and a sheath C4, as shown in drawing 1 . Shell composition is carried out, and it passes like the erector who mentions later, and is a core wire C1. The connector terminal D is connected (drawing 2 , three references), and it is a sheath C4. The corrugate tube E for shield electric wire protection is put on a side (refer to drawing 3). In addition, the shield electric wire C, the connector terminal D, and a corrugate tube E are the same as that of known composition, and omit the detailed explanation.

[0048] In drawing 1 and drawing 3 , 46 shows the sheath retaining ring extrapolated by the above-mentioned shield electric wire C, and is formed with the stage from stopper section 46a of a major diameter, and *****46b of a minor diameter. Stopper section 46a has the path of the size which the front end edge attaches to the inside side of each electric wire stop salient 40 of the corrugated electrode holder B. Moreover, the ring-like rubber stopper with which 47 is extrapolated by the aforementioned shield electric wire C, and 48 are the same, and a braid retaining ring and 49 show the 2nd shell member formed from the conductive metallic pipe etc. the 2nd shell -- a member 49 has major-diameter section 49a in the center, and is formed with the stage where it order serves as narrow diameter portions 49b and 49c Furthermore, 50 is the inner bark C2 of the aforementioned shield electric wire C. It is the inner-bark retaining ring extrapolated, and flange 50a is formed in the back end. The inner-bark retaining ring 50 is an insulator, for example, is fabricated by Nylon 66 (tradename) which has the thermal resistance strengthened by the glass fiber. 51 is the sticking-by-pressure section D1 of the connector terminal D. The heat-shrinkable tubing (refer to drawing 1) to receive is shown.

[0049] The processing process over the shield electric wire C is explained concretely, referring to drawing 5 . First, the sheath retaining ring 46 is set to the terminal section of the shield electric wire C (drawing 5 (a)). Next, the sheath retaining ring 46 is inserted in the shield electric wire C from the ***** 46b side (drawing 5 (b)). The edge of the shield electric wire C is made to hold to attaching part 52a of **** equipment 52, and it is ***** (drawing 5 (c)) about ***** 46b by dice 52b. thereby -- sheath C4 Braid C3 etc. -- being stuck firmly (drawing 5 (d)) It scalps with the fixture which does not illustrate the terminal section of the shield electric wire C, and they are a braid C3, an inner bark C2, and a core wire C1. It is made to expose in order (drawing 5 (e)). ***** 46b -- caulking *****'s -- scalping -- setting -- sheath C4 etc. -- gap is not produced

[0050] Next, it explains concretely, referring to drawing 6 or drawing 9 about the erector of the shield connector 21 degree. As shown in drawing 6 , it is a sheath C4. A rubber stopper 47 is inserted. As for a rubber stopper 47, it is desirable in that case to prepare an interval with the sheath retaining ring 46 at least by the thickness of the electric wire stop salient 40 of each half covering 36. In addition, in the processing process over the above-mentioned shield electric wire C, you may extrapolate a rubber stopper 47 on the shield electric wire C with the sheath retaining ring 46. then, the braid retaining ring 48 -- braid C3 a periphery -- inserting -- the 2nd shell -- narrow diameter portion 49c behind a member 49 -- braid C3 Inner bark C2 It inserts in between. the 2nd shell -- narrow diameter portion 49b ahead of a member 49 -- inner bark C2 It is in contact with the inner bark C2 so that it may hold.

[0051] Then, further, a corrugate tube E is pulled and brought near so that the sheath retaining ring 46

may be covered (the inside of drawing, the direction of ***** Q), and the half coverings 36 and 36 are engaged from the both sides (the inside of drawing, the direction of ***** R) of a corrugate tube E. At this time, it is **** E1 of a corrugate tube E. While being attached in the tube attachment slot 41 of two or more articles of the inner covering 38, the engagement stop of the shield electric wire C is carried out at the nose of cam of the electric wire stop salient 40. Moreover, the pin-like salient 42 and salient **** 43 which were prepared in each inner covering 38 fit in, respectively, it unifies and each half covering 36 forms the corrugated electrode holder B (refer to drawing 7).

[0052] Next, as shown in drawing 7, the corrugated electrode holder B which carried out the engagement stop of the shield electric wire C and corrugate tube E which passed through the above-mentioned process is set to the electric wire attachment case A, and these are attached (the inside of drawing, the direction of ***** S). While the case plug room 39 is put on the case main part 24, the inner covering 38 is held in the electrode-holder engagement room 31, and the fitting stop of the fixed hole 45 is carried out further at the fixed salient 29. As shown to drawing 8 by this, an engagement stop will be firmly carried out in the electric wire attachment case A by the corrugated electrode holder B.

[0053] Setting in this state, the shield electric wire C is the core wire C1. Inner bark C2 It is equipped so that it may jump out of the front end opening 27 of the electric wire attachment case A. Moreover, while the rubber stopper 47 inserted in the electric wire attachment case A together with the shield electric wire C is stopped by the level difference 34, peripheral face 47a of a rubber stopper 47 and the rubber stopper engagement room 32 are engaged watertight. on the other hand -- the 2nd shell -- the 1st shell with which major-diameter section 49a of a member 49 and the front end opening 27 were equipped -- a member 28 -- contacting -- braid C3 The exterior and an electric flow are attained.

[0054] it is shown in drawing 9 -- as -- inner bark C2 the inner-bark retaining ring 50 -- the 2nd shell from the flange 50a side -- it inserts until it contacts narrow diameter portion 49b of a member 49 The inner-bark retaining ring 50 is an inner bark C2 by known meanses, such as adhesives. It fixes. Next, core wire C1 The connector terminal D is stuck by pressure and it is this sticking-by-pressure section D1. Heat-shrinkable tubing 51 is put. It is heated, and contracts and heat-shrinkable tubing 51 is the sticking-by-pressure section D1. It protects.

[0055] since the shield electric wire C is equipped with the sheath retaining ring 46 in the state of caulking **** in the form of 1 operation of this invention as explained above -- sheath C4 Braid C3 etc. -- firm -- sticking -- sheath C4 etc. -- gap is not produced moreover, even if force which draws out the connector terminal D from the electric wire attachment case A joins the shield electric wire C, stopper section 46a of the sheath retaining ring 46 is stopped by the electric wire stop salient 40, and the movement regulates the shield electric wire C -- having -- sheath C4 etc. -- gap is not produced furthermore, even if force which pushes the connector terminal D against the electric wire attachment case A joins the shield electric wire C, flange 50a of the inner-bark retaining ring 50 is stopped by the front end opening 27 of the electric wire attachment case A, and, as for the shield electric wire C, the movement is regulated like the above -- ***** -- sheath C4 etc. -- gap is not produced

[0056] In addition, while a rubber stopper 47 is pressed down, it will be certainly inserted in the rubber stopper engagement room 32 by the outside side of each electric wire stop salient 40, and the troublesomeness which pushes in a rubber stopper 47 by hand one by one is canceled, and it leads to improvement in workability. moreover, the inner-bark retaining ring 50 -- the 2nd shell -- while becoming a stopper for preventing movement to the front of a member 49 -- the connector terminal D -- the 1st or 2nd shell -- members 28 and 49 can be contacted and it can prevent short-circuiting Furthermore, the inner-bark retaining ring 50 also becomes a stopper for preventing that the electric wire attachment case A moves to the connector terminal D side again.

[0057] since the corrugated electrode holder B consists of the half coverings 36 and 36 of a couple which carry out phase opposite -- fabrication -- while being able to make into smallness the rate which occupies metal mold -- fabrication -- the die split structure of metal mold is simplified, and **** becomes possible even if [much] it does not use large-sized forming equipment Therefore, the effect that a manufacturing cost can be pressed down low is done so. Moreover, since it is easy work habits in which the electric wire attachment case A is made to attach the corrugated electrode holder B etc. after

being engaged so that each half covering 36 may be put from the both sides of a corrugate tube E, those who do work with a group for the first time can also attach the shield connector 21 easily.

[0058] Drawing 10 shows the form of other operations of the shield connector of this invention. The shield connector 61 is composition which changes into the electric wire attachment case A of the above-mentioned shield connector 21, and applies the connector case F, since other composition is the same as that of the shield connector 21 almost, it omits detailed explanation, and it explains the connector case F below.

[0059] The connector case F consists of the outer case 62 made of synthetic resin, and the same inner case 63 made of synthetic resin, it is the cylinder object in which ends carried out opening, respectively, and, as for both the outer case 62 and the inner case 63, conductive metal plating is given.

[0060] Bulge formation of the hood 64 with which the outer case 62 accepts the connector (not shown) of the other party in a front portion is carried out. A hood 64 has the septum 65 of the shape of a cylinder over the case of the other party connector which does not carry out [aforementioned] illustration inside, and the hold room 66 is formed in the outside of a septum 65 with this septum 65 and the hood 64. The packing 67 made of silicone rubber is inserted in the hold room 66. Moreover, the stop salients 68 and 68 to the inner case 63 protrude on the nose-of-cam side at inner skin 65a of a septum 65. In addition, 69 shows the rocking arm to the other party connector which is not illustrated.

[0061] On the other hand, the fixed salients 70 and 70 to the fixed hole 45 of the corrugated electrode holder B mentioned above in peripheral-wall 62a carry out phase opposite, and the back portion of the outer case 62 protrudes.

[0062] The inner case 63 is formed with the stage from the terminal stop section 71 of a minor diameter, and the interior 72 of a proposal-ed of the major diameter to inner circle wall 62b of the outer case 62. A stopper 73 is formed at the nose of cam of the terminal stop section 71, and the terminal stop salient 74 is formed in the middle of wall 71a. The stop holes 75 and 75 corresponding to each stop salient 68 of the outer case 62 are formed in the front portion at outer wall 71b of the terminal stop section 71.

[0063] In the above-mentioned composition, from the back of the outer case 62, the connector case F inserts the inner case 63, and is formed. The stop hole 75 fits into the stop salient 68, and a part for the first portion of outer wall 71b of the terminal stop section 71 is held at a septum 65.

[0064] in addition, the shield electric wire C -- sheath C4 the above-mentioned sheath retaining ring 46 and rubber stopper 47' insert -- having -- core wire C1 **** -- known jack terminal D' is stuck by pressure Braid C3 The nose of cam is turned up outside and the part is fastened to the outer case 62 and rubber stopper 47' in the assembly of the shield connector 61.

[0065] When the corrugated electrode holder B which carried out the engagement stop of the above-mentioned shield electric wire C and the corrugate tube E is made to attach to the connector case F, connector terminal D' inserted from the back of the outer case 62 is firmly fixed by a stopper 73 and the terminal stop salient 74. The case plug room 39 of the corrugated electrode holder B covers the back end portion of the outer case 62, and the fixed salient 70 and the fixed hole 45 fit in.

[0066] Thus, not only the above-mentioned electric wire attachment case A but the connector case F is formed possible [attachment], and the corrugated electrode holder B has high versatility. Moreover, as mentioned by explanation of the shield connector 21, reduction of a manufacturing cost can be performed also in this form, and gap of a sheath etc. is not produced, either.

[0067] Although the above explained using the shield electric wire C, it is effective not only this but to use the sheath retaining ring 46 mentioned above, in order to make electric wires which converged, such as wire harness, apply and to prevent gap of each electric wire. Moreover, the electric wire stop salient 40 may be changed into the salient, and may be a protruding line, and it is desirable to form the curved surface corresponding to the circumference of the shield electric wire C at the nose of cam of a projection side of a protruding line. Furthermore, since the half covering 36 is constituted so that die split structure may become simple, even if it adopts the structure which connects each half coverings 36 and 36 with a hinge temporarily, it does not become complicated die split structure again.

[0068]

[Effect of the Invention] According to this invention indicated to have explained above by the claim 1, a

shield connector The connector terminal connected to the terminal section of a shield electric wire, and the electric wire attachment case fixed to the attachment mouth which carried out protection hold of the terminal section of a shield electric wire, and carried out opening to the case of an electrical machinery and apparatus, It has the corrugated electrode holder with which the electric wire attachment case electric wire insertion-side is equipped, and the corrugate tube for shield electric wire protection connected to an electric wire attachment case electric wire insertion-side through a corrugated electrode holder. Moreover, a corrugated electrode holder consists of half covering of a couple which carries out phase opposite, and each half covering forms the case plug room to an electric wire attachment case electric wire insertion-side between outer covering and inner covering while being equipped with outer covering and inner covering. Inner covering equips the other end with the tube attachment slot of two or more articles which engages with a corrugate tube while equipping the end section of inner skin with the electric wire stop section corresponding to a shield electric wire. Moreover, outer covering has a covering fixed part corresponding to the peripheral wall of an electric wire attachment case. fabrication since it has in one the composition attached in an electric wire attachment case and is a symmetrical configuration, while each half covering carries out the engagement stop of a shield electric wire and the corrugate tube according to this -- since the die split structure of metal mold can be simplified, per metal mold can take even if it does not use still more large-sized forming equipment, and a number can also be increased, it is the shield connector which can reduce a manufacturing cost

[0069] According to this invention of a claim 2, by inserting the sheath retaining ring which compresses the direction of a path into the sheath of a shield electric wire, even if sudden external force joins a shield electric wire, the effect that gap of a sheath etc. can be prevented is done so.

[0070] According to this invention of a claim 3, from ***** of a minor diameter, and the stopper section of a major diameter, a sheath retaining ring has a level difference and is formed. The stopper section has the path of the size which the edge which carries out opening can attach to the electric wire stop section of a corrugated electrode holder. Even if sudden external force joins a shield electric wire by this and a shield electric wire moves, the effect that the stopper section is stopped by the electric wire stop section, and can prevent gap of a sheath etc. is done so.

[0071] By inserting the rubber stopper in which the electric wire stop section and engagement are possible in a shield electric wire, in the assembly of a shield connector, the electric wire stop section can hold down a rubber stopper, it can insert in an electric wire attachment case certainly, there is no troublesomeness which puts in a rubber stopper by hand one by one, and, according to this invention of a claim 4, the effect of improving workability is done so.

[0072] According to this invention of a claim 5, the electric wire stop section is engaged between the sheath retaining rings and rubber stoppers which were inserted in the shield electric wire. Thereby, the electric wire stop section does so the effect that gap prevention of a sheath etc. and the improvement of workability to a rubber stopper can be accomplished easily.

[0073] since the electric wire stop sections are two or more salients which project at equal intervals towards the shaft of a corrugated electrode holder according to this invention of a claim 6 -- fabrication - - the die split structure of metal mold can be simplified, and the effect that engagement of half covering, simultaneously the nose of cam of a salient can stop a shield electric wire is done so

[0074] since the electric wire stop section is a protruding line holding a shield electric wire according to this invention of a claim 7 -- fabrication -- the die split structure of metal mold can be simplified, and the effect that a shield electric wire can be stopped on the curved surface at engagement of half covering, simultaneously the nose of cam of a protruding line is done so

[0075] According to this invention of a claim 8, the inner bark of a shield electric wire is extended from opening by the side of the connector terminal strapping of an electric wire attachment case. The inner-bark retaining ring with a collar in which the aforementioned opening and attachment are possible is inserted in an inner bark. Even if sudden external force tends to join a shield electric wire by this and a shield electric wire tends to move, the effect that an engagement stop is carried out at an electric wire attachment case, and an inner-bark retaining ring can prevent gap of a sheath etc. is done so.

[0076] the shell through which an inner-bark retaining ring flows electrically in the braid of a shield

shield connector The connector terminal connected to the terminal section of a shield electric wire, and the electric wire attachment case fixed to the attachment mouth which carried out protection hold of the terminal section of a shield electric wire, and carried out opening to the case of an electrical machinery and apparatus, It has the corrugated electrode holder with which the electric wire attachment case electric wire insertion-side is equipped, and the corrugate tube for shield electric wire protection connected to an electric wire attachment case electric wire insertion-side through a corrugated electrode holder. Moreover, a corrugated electrode holder consists of half covering of a couple which carries out phase opposite, and each half covering forms the case plug room to an electric wire attachment case electric wire insertion-side between outer covering and inner covering while being equipped with outer covering and inner covering. Inner covering equips the other end with the tube attachment slot of two or more articles which engages with a corrugate tube while equipping the end section of inner skin with the electric wire stop section corresponding to a shield electric wire. Moreover, outer covering has a covering fixed part corresponding to the peripheral wall of an electric wire attachment case. fabrication since it has in one the composition attached in an electric wire attachment case and is a symmetrical configuration, while each half covering carries out the engagement stop of a shield electric wire and the corrugate tube according to this -- since the die split structure of metal mold can be simplified, per metal mold can take even if it does not use still more large-sized forming equipment, and a number can also be increased, it is the shield connector which can reduce a manufacturing cost

[0069] According to this invention of a claim 2, by inserting the sheath retaining ring which compresses the direction of a path into the sheath of a shield electric wire, even if sudden external force joins a shield electric wire, the effect that gap of a sheath etc. can be prevented is done so.

[0070] According to this invention of a claim 3, from ***** of a minor diameter, and the stopper section of a major diameter, a sheath retaining ring has a level difference and is formed. The stopper section has the path of the size which the edge which carries out opening can attach to the electric wire stop section of a corrugated electrode holder. Even if sudden external force joins a shield electric wire by this and a shield electric wire moves, the effect that the stopper section is stopped by the electric wire stop section, and can prevent gap of a sheath etc. is done so.

[0071] By inserting the rubber stopper in which the electric wire stop section and engagement are possible in a shield electric wire, in the assembly of a shield connector, the electric wire stop section can hold down a rubber stopper, it can insert in an electric wire attachment case certainly, there is no troublesomeness which puts in a rubber stopper by hand one by one, and, according to this invention of a claim 4, the effect of improving workability is done so.

[0072] According to this invention of a claim 5, the electric wire stop section is engaged between the sheath retaining rings and rubber stoppers which were inserted in the shield electric wire. Thereby, the electric wire stop section does so the effect that gap prevention of a sheath etc. and the improvement of workability to a rubber stopper can be accomplished easily.

[0073] since the electric wire stop sections are two or more salients which project at equal intervals towards the shaft of a corrugated electrode holder according to this invention of a claim 6 -- fabrication - - the die split structure of metal mold can be simplified, and the effect that engagement of half covering, simultaneously the nose of cam of a salient can stop a shield electric wire is done so

[0074] since the electric wire stop section is a protruding line holding a shield electric wire according to this invention of a claim 7 -- fabrication -- the die split structure of metal mold can be simplified, and the effect that a shield electric wire can be stopped on the curved surface at engagement of half covering, simultaneously the nose of cam of a protruding line is done so

[0075] According to this invention of a claim 8, the inner bark of a shield electric wire is extended from opening by the side of the connector terminal strapping of an electric wire attachment case. The inner-bark retaining ring with a collar in which the aforementioned opening and attachment are possible is inserted in an inner bark. Even if sudden external force tends to join a shield electric wire by this and a shield electric wire tends to move, the effect that an engagement stop is carried out at an electric wire attachment case, and an inner-bark retaining ring can prevent gap of a sheath etc. is done so.

[0076] the shell through which an inner-bark retaining ring flows electrically in the braid of a shield

electric wire according to this invention of a claim 9 -- it becomes a stopper to movement by the side of the aforementioned connector terminal of a member, and a stopper to movement by the side of the terminal of an electric wire attachment case thereby -- shell -- gap of a member can be prevented and the effect that generating of an electric poor contact is also avoidable is done so

[0077] According to this invention of a claim 10, since the inner-bark retaining ring is fabricated by the insulator, the effect that short-circuit with a connector terminal and the above-mentioned shell member can be prevented is done so.

[0078] According to this invention of a claim 11, a shield connector The connector terminal connected to the terminal section of a shield electric wire, and the inner case which holds a connector terminal and carries out stop fixation, The outer case which covers the terminal section of a shield electric wire and is connected to the connector of the other party while surrounding this inner case, It has the corrugated electrode holder with which an outer case electric wire insertion-side is equipped, and the corrugate tube for shield electric wire protection connected to an outer case electric wire insertion-side through this corrugated electrode holder. Moreover, a corrugated electrode holder consists of half covering of a couple which carries out phase opposite, and each half covering forms the case plug room to an aforementioned outer case electric wire insertion-side between outer covering and inner covering while being equipped with outer covering and inner covering. Inner covering equips the other end with the tube attachment slot of two or more articles which engages with a corrugate tube while equipping the end section of inner skin with the electric wire stop section corresponding to a shield electric wire. Moreover, outer covering has a covering fixed part corresponding to the peripheral wall of the aforementioned outer case. fabrication since it has in one the composition attached in an outer case and is a symmetrical configuration, while each half covering carries out the engagement stop of a shield electric wire and the corrugate tube according to this -- since the die split structure of metal mold can be simplified, per metal mold can take even if it does not use still more large-sized forming equipment, and a number can also be increased, it is the shield connector which can reduce a manufacturing cost

[0079] According to this invention of a claim 12, by inserting the sheath retaining ring which compresses the direction of a path into the sheath of a shield electric wire, even if sudden external force joins a shield electric wire, the effect that gap of a sheath etc. can be prevented is done so.

[0080] According to this invention of a claim 13, from ***** of a minor diameter, and the stopper section of a major diameter, a sheath retaining ring has a level difference and is formed. The stopper section has the path of the size which the edge which carries out opening can attach to the electric wire stop section of a corrugated electrode holder. Even if sudden external force joins a shield electric wire by this and a shield electric wire moves, the effect that the stopper section is stopped by the electric wire stop section, and can prevent gap of a sheath etc. is done so.

[Translation done.]